



COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
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**MODIFIED APPROVAL FOR REMEDIAL USE**  
Pursuant to Title 5, 310 CMR 15.000

Name and Address of Applicant:

Geoflow, Inc.  
500 Tamal Plaza, Suite 506  
Corte Madera, CA 94925

**Trade name of technology and model:** Geoflow Subsurface Drip Wastewater Disposal System - Geoflow WASTEFLOW® Classic WF-16-4-24; WF-16-4-12; WF-Special Order; and Geoflow WASTEFLOW® PC WFPC-16-4-24; WFPC-16-4-12; WFPC-16-4-6; WFPC-Special Order Units (hereinafter the "System"). Schematic drawings of typical Systems, a Design Manual and a technology checklist are attached and are a part of this Approval.

**Transmittal Number:** W032585  
**Date of Issuance:** September 26, 2003, Revised August 18, 2004, Modified December 14, 2006, August 21, 2007, February 22, 2008

**Authority for Issuance**

Pursuant to Title 5 of the State Environmental Code, 310 CMR 15.000, the Department of Environmental Protection hereby issues this Modified Approval for Remedial Use to: Geoflow, Inc., 500 Tamal Plaza, Suite 506, Corte Madera, CA 94925 (hereinafter "the Company"), approving the System described herein for Remedial Use in the Commonwealth of Massachusetts. Sale and use of the System are conditioned on compliance by the Company and the System owner with the terms and conditions set forth below. Any noncompliance with the terms or conditions of this Approval constitutes a violation of 310 CMR 15.000.

Glenn Haas, Acting Assistant Commissioner  
Bureau of Resource Protection

February 22, 2008  
Date

## **I. Purpose**

1. The purpose of this Approval is to allow use of the System in Massachusetts, on a Remedial Use basis.
2. With the necessary permits and approvals required by 310 CMR 15.000, this Approval for Remedial Use authorizes the use and installation of the System in Massachusetts.
3. The System may only be installed on facilities that meet the criteria of 310 CMR 15.284(2). The System is used to dispose of wastewater from an alternative system approved in accordance with 310 CMR 15.280 through 15.289 with effluent discharge concentrations that meet or exceed secondary treatment standards of 30 mg/L biochemical oxygen demand (BOD5) and 30 mg/L total suspended solids (TSS).
4. This Approval for Remedial Use authorizes the use of the System where the local approving authority finds that the System is for upgrade of a failed, failing or nonconforming system and the design flow for the facility is less than 10,000 gallons per day (GPD).

## **II. Design Standards**

1. The System is a subsurface drip dispersal system that replaces a soil absorption system (SAS) designed in accordance with 310 CMR 15.000. The System consists of small diameter flexible polyethylene tubing, extruded with an inner lining of a biocide growth retardant compound to prevent slime buildup on the inner wall of the tubing. Pressure sensitive drip emitters spaced at regular intervals shall incorporate use of chemical root intrusion barrier to prevent root intrusion with a warranty period of no less than 10 years. The tubing is pressure dosed. The System also consists of two manifolds or headers; one to feed and the other to flush the dispersal system, vents at the end of each header pipe, a field flush valve and a spin filter with stainless steel 100 micron/150 mesh screen. The System is designed to replace the SAS and to distribute effluent from a treatment unit at a depth of 6 to 10 inches below the ground surface.
2. The System may be installed in the A, B or C soil horizon at a depth of at least 6 inches below the finished grade, or in fill material meeting the specifications at 310 CMR 15.255(3).
3. All access ports and manhole covers shall be installed and maintained at grade to allow for maintenance of the System.
4. The control panel including alarms and controls shall be mounted in a location always accessible to the System operator.
5. The System may be installed in soils with a percolation rate of up to 90 minutes per inch (MPI). The System shall not be installed in Class IV soils as defined in 310 CMR 15.242.
6. Effluent loading rates shall be as described in 310 CMR 15.242 except, however, for soils with percolation rates greater than 60 MPI, the effluent loading rate shall not exceed 0.1 gallons per day per square foot.

7. System shall not be designed and constructed with less than 400 linear feet of drip tubing with a minimum spacing of 12 inches.
8. The System is equivalent to a pressure distribution system designed in accordance with the Department's Pressure Distribution Guidance.
9. The System includes:
  - A. A pump chamber and pump capable of delivering pressure of 10-45 psi at the SAS a minimum of 6 times per day. The field pressure shall be controlled using a pressure regulator or manual valves to achieve design pressure (10-45 psi).
  - B. Time dosing for drip systems with a timer controller capable of operating the system during peak flow events without high-level alarms.
  - C. A self-cleaning filter with a minimum 150-mesh size/100 micron screen installed prior to the discharge of effluent to the drip tubing. The filter shall be provided with a flush valve on the debris end; a ball with a constant bleed or a solenoid valve that can be activated by the timer.
  - D. Air vacuum breakers at each high point of the drip header distribution system and on the drip line when the drip line is installed at a higher elevation than the headers. Air vacuum breakers shall be accessible from finished grade and insulated to protect from freezing.
  - E. Wasteflow Classic or Wasteflow PC drip tubing lines are spaced 24 inches apart with drip tubing emitters spaced 24 inches on center. When smaller spacing is used the dispersal field shall still be sized based on the minimum 24-inch spacing. When tubing line spacing is greater than 24 inches by 24 inches, the size of the dispersal field shall be increased so that the number of emitters is equal to the number that would have been installed in the standard 24 inch by 24 inch scenario.
  - F. The dispersal area shall not be installed under a paved surface.
  - G. No change in existing surface slope over the dispersal field is required to comply with 310 CMR 15.240(10).
10. The effective effluent dispersal area shall be calculated as the bottom area of the drip tubing system including a one-foot addition on each side or two square feet per foot of drip tube when tubing is spaced 2 feet apart. No sidewall credit shall be given for this System.
11. The drip tubing manifolds and supply lines and headers shall be sloped to allow effluent to drain back to the effluent pump (dosing) chamber by gravity to prevent freezing or installed at a depth of least four feet.
12. All valve boxes and air vacuum breaker boxes shall be insulated to prevent freezing.
13. The system designer shall complete and submit to the approving authority a System design worksheet included in the Design Manual with the plans and specifications.
14. Drip tubing may be installed with a vibratory plow, a static plow, a narrow trencher (<6" width), by hand trenching, or by scarifying the surface and bedding the drip tubing in clean sand meeting the requirements for fill material in Title 5 at 310 CMR 15.255(3) with cover

consisting of sand and topsoil meeting the 6 to 12 inch depth requirement. Vegetative cover must be replaced for installations where soils are removed and replaced.

15. Drip tubing shall not be installed when soils are frozen or saturated.
16. Prior to System start up, a clean water test of the System shall be performed in the presence of the approving authority to check for leaks and for the proper distribution of effluent.
17. The unit malfunction and high water alarms shall each be connected to an independent power source from the operating pump(s) run from the main power source of the facility.

### **III. Allowable Soil Absorption System Design**

1. Any reduction in System design shall be based on the allowable design, siting and installation requirements for the alternative treatment system that precedes the System.

### **IV. General Conditions**

1. All provisions of 310 CMR 15.000 are applicable to the use of this System, the System owner and the Company, except those that specifically have been varied by the terms of this Approval.
2. Any required operation and maintenance, monitoring and testing shall be performed in accordance with a Department approved plan. Any required sample analysis shall be conducted by an independent U.S.EPA or DEP approved testing laboratory, or a DEP approved independent university laboratory. It shall be a violation of this Approval to falsify any data collected pursuant to an approved testing plan, to omit any required data or to fail to submit any report required by such plan.
3. The facility served by the System and the System itself shall be open to inspection and sampling by the Department and the local approving authority at all reasonable times.
4. In accordance with applicable law, the Department and the local approving authority may require the System owner to cease operation of the system and/or to take any other action as it deems necessary to protect public health, safety, welfare and the environment.
5. The Department has not determined that the performance of the System will provide a level of protection to public health and safety and the environment that is at least equivalent to that of a sewer system. No System shall be installed, upgraded or expanded, if it is feasible to connect the facility to a sanitary sewer, unless as allowed by 310 CMR 15.004. When a sanitary sewer connection becomes feasible, the facility served by the System shall be connected to the sewer, within 60 days of such feasibility, and the System shall be abandoned in compliance with 310 CMR 15.354, unless a later time is allowed, in writing, by the approving authority.
6. Design, installation and operation shall be in strict conformance with the Company's DEP approved plans and specifications, 310 CMR 15.000 and this Approval.

7. Pressure distribution designed in accordance with Department guidance is required for all Remedial Approved systems. All applicable requirements within the Department's *Pressure Distribution Guidance*, dated May 24, 2002, shall be followed in the design of the System. The guidance document can be viewed at <http://mass.gov/dep/water/laws/policies.htm#t5guid> under *Title 5/Septic Systems Guidance*.

**V. Conditions Applicable to the System Owner**

1. The System is approved for the treatment and disposal of sanitary sewage only. Any wastes that are non-sanitary sewage generated or used at the facility served by the System shall not be introduced into the System and shall be lawfully disposed.
2. Effluent discharge concentrations from the treatment unit discharging to the System shall meet or exceed secondary treatment standards of 30 mg/L biochemical oxygen demand (BOD<sub>5</sub>) and 30 mg/L total suspended solids (TSS). The effluent pH shall not be less than 6.0 or more than 9.0 standard units (S.U.).
3. Any effluent samples shall be taken at a flowing discharge point, i.e. distribution box, pump chamber or other Department approved location downstream of the treatment unit. Any required influent sample shall be taken at a point that will provide a representative sample of the influent. The system designer, subject to written approval by the Department, shall determine influent sampling locations.
4. The System owner shall have the Company or its designee conduct a design review for any proposed non-residential System or any residential System with a design flow 2,000 GPD or greater to ensure that the proposed use of the System is consistent with the unit's capabilities.
5. Operation and Maintenance Agreement:
  - A. Throughout its life, the owner shall operate and maintain the System in accordance with the Company and designer's operation and maintenance requirements and this Approval. To ensure proper operation and maintenance (O&M), the owner shall enter into an O&M agreement. No O&M agreement shall be for less than one year.
  - B. No System shall be used until an O&M agreement is submitted to the approving authority which:
    - i. Provides for the contracting of a person or firm trained by the Company as provided in Section VI (5) and competent in providing services consistent with the System's specifications, with the operation and maintenance requirements specified by the Company and the designer, and with any specified by the Department;
    - ii. Contains procedures for notification to the Department and the local board of health within five days of a System failure or alarm event and for corrective measures to be taken immediately; and
    - iii. Provides the name of an operator, which must be a Massachusetts certified operator if one is required by 257 CMR 2.00, that will operate and monitor the System. The alternative treatment unit discharging from a single family home shall

be inspected and field tested in accordance with the Department's *Inspection and Sampling in Title 5 I/A Single Family Home Remedial and General Use Treatment Systems with Design Flows Less than 2000 gallons/day*, dated January 1, 2006. For all other facilities, treatment unit inspections and effluent testing shall be completed quarterly, with laboratory analysis of the following parameters: pH, BOD5, and TSS. The operator shall also, at each site visit and anytime there is an alarm event, conduct an inspection using the Company's technology checklist of the System's filter system, pumps, valves, etc., disposal area where the System is installed for signs of breakout or dampness and complete any required maintenance. When quarterly sampling and inspection are required, after one year of sampling and inspection and at the written request of the System owner, the Department may reduce the monitoring and reporting requirement. The above Department policy can be viewed on the internet at <http://mass.gov/dep/water/wastewater/iatechs.htm>.

6. The System owner shall at all times have the System properly operated and maintained in accordance with this Approval, the designer's operation and maintenance requirements and the Company's approved procedures and sampling protocols. The System owner shall notify the Department and the local approving authority in writing within seven days of any cancellation, expiration or other change in the terms and/or conditions of their O&M agreement.
7. Prior to transferring any or all interest in the property served by the System, or any portion of the property, including any possessory interest, the System owner shall provide written notice of all conditions contained in this Approval to the transferee(s). Any and all instruments of transfer and any leases or rental agreements shall include as an exhibit attached thereto and made a part thereof a copy of this Approval for the System. The System owner shall send a copy of such written notification(s) to the Department and local approving authority within 10 days of such notice being given.
8. By January 31<sup>st</sup> of each year for the previous year, the System owner shall submit to the local approving authority all data collected in accordance with item 5, above, including all Department Title 5 IA O&M checklists and System technology checklists completed during the previous calendar year by the System operator for each inspection performed.
9. Prior to the issuance of a Certificate of Compliance for the System, the System owner shall record and/or register in the appropriate Registry of Deeds and/or Land Registration Office, a Notice disclosing both the existence of the alternative septic system subject to this Approval on the property and the Department's approval of the System. If the property subject to the Notice is unregistered land, the Notice shall be marginally referenced on the owner's deed to the property. Within 30 days of recording and/or registering the Notice, the System owner shall submit the following to the Department and the local approving authority: (i) a certified Registry copy of the Notice bearing the book and page/instrument number and/or document number; and (ii) if the property is unregistered land, a Registry copy of the owner's deed to the property, bearing the marginal reference.

## VI. Conditions Applicable to the Company

1. By January 31<sup>st</sup> of each year, the Company shall submit a report to the Department, signed by a corporate officer, general partner or Company owner that contains information on the System, for the previous calendar year. The report shall state: the number of units of the System sold for use in Massachusetts including the installation date and date of start-up during the previous year; identify the treatment technology preceeding the System; the address of each installed System, the owner's name and address, the type of use (e.g. residential, commercial, institutional) and the design flow; and for all Systems installed since the date of issuance of this Approval, all known failures, malfunctions, and corrective actions taken and the address of each such event. An electronic file of this data in spreadsheet format may be provided to the Department at *Dep.Waterpermitting@state.ma.us*, if possible. The emailed file should identify in the subject line the technology name, approval type and year of data included. The Company shall maintain copies of all completed inspection forms and certified laboratory results for possible audit for at least three years.
2. The Company shall notify the Director of the Wastewater Management Program at least 30 days in advance of the proposed transfer of ownership of the technology for which this Approval issued. Said notification shall include the name and address of the proposed new owner and a written agreement between the existing and proposed new owner containing a specific date for transfer of ownership, responsibility, coverage and liability between them. All provisions of this Approval applicable to the Company shall be applicable to successors and assigns of the Company, unless the Department determines otherwise.
3. The Company shall develop and submit to the Department within 60 days of the effective date of this Approval: minimum installation requirements; an operating manual, including information on substances that should not be discharged to the System; and a recommended schedule for maintenance of the System essential to consistent successful performance of the installed Systems.
4. The Company shall make available, in print and electronic format, the referenced procedures and protocol in Section VI (3) to owners, operators, designers and installers of the System.
5. The Company shall institute and maintain a program of operator training and continuing education, as approved by the Department. The company shall update the list of qualified operators and make the list known to users of the technology.
6. The Company or its designee shall conduct a design review for any proposed non-residential System or any residential System with a design flow 2,000 GPD or greater to ensure that the proposed use of the System is consistent with the unit's capabilities.
7. The Company shall furnish the Department any information that the Department requests regarding the System within 21 days of the receipt of that request.
8. The Company shall include copies of this Approval and the procedures and protocol described in Section VI (3) for each System that is sold. Also, in any contract executed by the Company for distribution or re-sale of the System, the Company shall require the distributor or re-seller to provide each purchaser of the System with copies of this Approval and the procedures and protocol described in Section VI (3).

9. The Company shall comply with 310 CMR 15.000 and all the Department policies and guidance that apply and as they may be amended from time to time.

#### **VIII. Reporting**

1. All notices and documents required to be submitted to the Department by this Approval shall be submitted to:

Director  
Wastewater Management Program  
Department of Environmental Protection  
One Winter Street - 5th floor  
Boston, Massachusetts 02108

#### **IX. Rights of the Department**

1. The Department may suspend, modify or revoke this Approval for cause, including, but not limited to, non-compliance with the terms of this Approval, non-payment of the annual compliance assurance fee, for obtaining the Approval by misrepresentation or failure to disclose fully all relevant facts or any change in or discovery of conditions that would constitute grounds for discontinuance of the Approval, or as necessary for the protection of public health, safety, welfare or the environment, and as authorized by applicable law. The Department reserves its rights to take any enforcement action authorized by law with respect to this Approval and/or the System against the owner, or operator of the System and/or the Company.